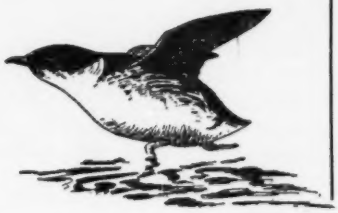
The MURRELET



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CHECK LIST OF MAMMALS OF THE OLYMPIC PENINSULA

MURRAY L. JOHNSON and SHERRY JOHNSON

This is a working list of mammals occurring in the Olympic Peninsula, Washington. The remarks made are largely the results of work during the past four years; during the past three years the senior author has served as collaborator in mammalogy for the Olympic National Park.

A great deal of field work remains to be done in this area. There is much inaccessible territory that should be investigated. Aside from this, one of the most interesting and significant phases of study is that of the distribution and fluctuation in numbers of these inhabitants of this relatively wild and untouched isolated area. This requires constant integrated field work; some suggestions along this line are indicated in the present work.

The topography of the Olympic Peninsula generally is that of central mountain masses to over 9000 feet with large rivers and irregular ridges descending in three directions to salt water. At the southern base the mountains and rivers descend into rolling forested ridges. There is considerable virgin timber merging into active lumbering operations and second growth as the lower elevations are reached, all around the peninsula.

The rainfall of the area is great, producing the luxuriant "rain forests" of the ocean coast area. There is also a great rain shadow that extends along the eastern border and which reaches its climax in the northeastern quadrant of the Peninsula. Here the rainfall is as low as 15 inches as contrasted with 130 inches a year along the coast. This rain shadow is also present in alpine areas where lessened snowfall produces a definite ecological difference.

There is a fairly large amount of Arctic-alpine Life Zone habitat, practically all of which is in the Park area. Likewise most of the Hudsonian Zone is within Park limits. The Canadian and Transition Life Zones merge into private and state owned lands at the periphery. There is a large ocean strip which has just been ordained. Thus we are assured a large primitive area for years to come; for this reason periodic reports of the active wildlife populations are extremely desirable.

In the following list the terms of relative densities of population are based on personal field experience correlated with extensive collecting in Western Washington. No attempt was made to utilize more technical methods of census taking. Marine mammals are not included in this report.

1—*Neurotrichus gibbsii gibbsii* (Baird) Shrew mole. Uncommon, but may be locally common. Has not been taken at higher elevations.

2—*Scapanus townsendi* (Bachman) Townsend mole. Abundant in all river valleys. Abundant in alpine country of the Deer Park and Hurricane Ridge areas. This is an interesting and unusual ecological habitat for this mole, the first so reported. Further investigation of this population is necessary.

3—*Scapanus orarius orarius* True Coast mole. Common, has not been taken at higher elevations. Usually more in the brushy areas than *townsendi*.

4—*Sorex cinereus streatori* (Merriam) Cinereus shrew. Rare. Has been taken in alpine and sea level habitats.

5—*Sorex trowbridgii trowbridgii* (Baird) Trowbridge shrew. Common in relatively dry dense forest habitat at lower elevation. *Sorex t. destructioni* Dalquest and Scheffer has been found to be invalid. The entire coastal population of Oregon and Washington is the same large shrew that inhabits Destruction Island. Inland there appears to be a cline with somewhat smaller individual of this species. A more accurate delineation of this presents an interesting problem.

6—*Sorex vagrans vagrans* (Baird) Wandering shrew. Common in marshy areas at lower elevations. Thus far has not been taken above the Transition Zone.

7—*Sorex obscurus setosus* (Elliot) Dusky shrew. Abundant in all parts of the Olympic Peninsula in a variety of habitats. This animal vies with *Peromyscus* in being the commonest species collected in small mammal traps. In August, 1951 it was rare in alpine Sol Duc Park.

8—*Sorex bendiri albiventer* (Merriam) Bendire's Olympic shrew. Common throughout the low country of the Peninsula. Generally it is found in swamps, but is occasionally taken in dense forest during damp weather. This subspecies is restricted to the Olympic Peninsula. The occurrence of individuals with dark ventral surfaces in the Sequim area demand further collection here.

9—*Sorex palustris navigator* (Baird) Mountain water shrew. Rare. Occurring at higher altitudes. For reasons not known to us we have found this species to be much less common here than in similar circumstances in the Cascade Mountains.

10—*Myotis lucifugus alascensis* (Miller) Alaska myotis. Uncommon. Reported from several areas on the Peninsula.

11—*Myotis yumanensis saturatus* (Miller) Yuma myotis. Abundant in the lower Elwha River valley. Apparently the most common small bat of the Olympic Peninsula.

12—*Myotis keeni keeni* (Merriam) Keen myotis. Rare. Reported from two areas on the Peninsula. These are the only specimens of this subspecies thus far reported in the United States, its range lying northward.

13—*Myotis evotis pacificus* (Dalquest) Long-eared myotis. Uncommon. We have collected this species on the Quinault and on the Elwha River.

14—*Myotis californicus caurinus* (Miller) California myotis. Uncommon. Has been collected in several areas of the southern part of the Peninsula.

15—*Myotis volans longicrus* (True) Long-legged myotis. Rare. Reported from two areas of the Olympic Peninsula.

16—*Corynorhinus rafinesquii townsendi* (Cooper) Long-eared bat. Rare. We have a single specimen from the Elwha River valley. Previously reported from Hood's Canal region.

It must be remarked that the above indications of the abundance of bats refers only to collected specimens and has little significance as to actual numbers. Three species that undoubtedly occur over the Peninsula are: *Lasionycteris noctivagans* (Le Conte) the silver haired bat, *Lasiurus cinereus cinereus* (Beauvois) the hoary bat, and *Eptesicus fuscus bernardinus* (Rhoads) the big brown bat.

17—*Ursus americanus altifrontalis* (Elliot) Black bear. Abundant. The numbers are somewhat restricted outside the Park due to a classification of predator, allowing year round hunting. Additional numbers are killed by logging personnel due to the recent implication of second growth tree girdling by this animal.

18—*Procyon lotor psora* (Gray) Raccoon. Abundant at lower elevations, particularly about the salt water beaches. The release of trapping pressure because of low fur value has allowed a large population to develop.

19—*Martes caurina caurina* (Merriam) Marten. Common locally in the high country except where disturbed by logging operations. Uncommon at sea level, including the ocean coast where it inhabits the cedar swamps.

20—*Martes pennanti pacifica* (Rhoads) Fisher. Uncommon, throughout the undisturbed virgin forests. In our opinion, formed largely by talking to old trappers and perusual of the literature, the Olympic Peninsula fisher population is the largest in the country. Winter tracking should be done for verification; however, we have personally seen one fisher (Hoh River) and have sight records from several reliable sources and know of one trapped accidentally December 1951. There is no reason why this area, particularly the Park, should not continue to support a relatively large population of this valuable fur-bearer.

21—*Mustela erminea olympica* (Hall) Ermine weasel. Common throughout the Olympic Peninsula. This subspecies is restricted to the Peninsula.

22—*Mustela frenata altifrontalis* (Hall) Long-tailed weasel. Common throughout the Peninsula.

23—*Mustela vison energumenos* (Bangs) Mink. Common throughout the Peninsula. This is the standard and substantial fur-bearer, along with the otter, that has continued to yield well each year.

24—*Lutra canadensis pacifica* (Rhoads) River otter. Common throughout the Peninsula. Good numbers are maintained despite fairly heavy trapping.

25—*Spilogale gracilis olympica* (Elliot) Little spotted skunk. Abundant throughout lower elevations, found up to about 2000 feet.

26—*Mephitis mephitis spissigrada* (Bangs) Striped skunk. Abundant at low altitude, particularly about the salt water beaches. As with the raccoon, the low fur value and absent trapping pressure has allowed a large build-up of this species.

27—*Canis latrans umpquensis* Jackson Coyote. Common throughout the Peninsula, apparently more so than in former years.

The status of the wolf (*Canis lupus fuscus* Richardson) is not entirely clear. Although thought extinct on the Peninsula many years ago, recent field observations by experienced men lead us to believe there may still be a few wolves in the Olympic Mountains. This is most likely in the relatively inaccessible Queets River drainage. Field work in this area should be done, particularly winter tracking and examination of upper river sand bars in the summer for tracks.

28—*Felis concolor olympus* (Merriam) Cougar. Common throughout the Olympic Peninsula. I doubt very much that many equally large areas in the country support and maintain such a heavy population of this large and interesting cat. A small scat analysis (28 samples) by Schwartz suggests that rabbits are an important source of food in the Olympics. There was 32.25% occurrence as compared to 23.55% deer and 8.82% elk.

29—*Lynx rufus fasciatus* (Rafinesque) Bobcat. Common throughout the Peninsula.

30—*Eutamias townsendi townsendi* (Bachman) Townsend chipmunk. Common and generally distributed over the lower altitudes.

31—*Eutamias townsendi cooperi* (Baird) Cooper chipmunk. Common and generally distributed over the higher altitudes. We do not know the altitudinal range where one subspecies grades into the other. It would be interesting to keep both color variations under like environmental circumstances to see if the differences are truly genetic.

32—*Eutamias amoenus caurinus* (Merriam) Olympic chipmunk. Common locally in alpine and subalpine conditions. This chipmunk has been found to be decidedly uncommon in most areas except Deer Park and Hurricane Ridge. This subspecies is found only in the Olympic Mountains.

33—*Marmota caligata olympus* (Merriam) Olympic marmot. Uncommon during the past three years. This species had a sudden die-off in 1947 or '48. This was following years of abundance when individuals wandered down as far as Lake Crescent and the Queets River bottom. According to reports and personal observation, they are decidedly rare over most of the Olympic Mountains with the exception of Deer Park and Tyler Peak. Here they have shown a good come-back. In our opinion the decline of population was probably due to a natural epizootic and not to any predator action. If this is true a slow build-up is to be expected. With obvious close affinities to *Marmota caligata* there is no valid reason for not including *olympus* as a subspecies of *caligata*.

34—*Tamiasciurus douglasi douglasi* (Bachman) Douglas squirrel. Abundant and generally distributed.

35—*Glaucomys sabrinus olympicus* (Elliot) Flying squirrel. Common and generally distributed. This subspecies is restricted to the Olympic Peninsula; further critical study of the population is desirable.

36—*Thomomys talpoides melanops* (Merriam) Olympic gopher. Rare. Only one colony was located in searching much alpine country, this near Oyster Lake above Sol Duc Basin. Another single fresh working was seen in 1949 along the High Divide overlooking the Hoh watershed. Other areas where they are known to have occurred are now devoid of any activity. On the basis of this information a die-off, possibly related to the marmot situation, is postulated.

37—*Thomomys talpoides couchi* (Goldman) Couch gopher. Rare. Known only from the extreme southeastern portion of the Peninsula, near Shelton. When last investigated in 1950 there was meager evidence of activity in the Scott's Prairie colony. Leo Couch has more recently found an active colony to the east on the bluffs overlooking the Sound.

38—*Castor canadensis leucodonta* (Gray) Beaver. Common and generally distributed at lower elevations.

39—*Peromyscus maniculatus oreas* (Bangs) Deer mouse. Common and generally distributed. Interestingly enough deer mice were rare in the alpine areas of Deer Lake and Sol Duc Park in 1950-51 but were common in the Deer Park and Hurricane Ridge areas.

40—*Neotoma cinerea occidentalis* (Baird) Pack rat. Uncommon but generally distributed from sea level to alpine areas.

41—*Phenacomys intermedius olympicus* (Elliot) Heather vole. Common in alpine country. In Sol Duc Park 1952 this species was secured in a variety of habitat, and was the most common small mammal after *Microtus l. macrurus*.

42—*Clethrionomys gapperi occidentalis* (Merriam) Western red-back mouse. Uncommon at lower altitudes in deep forests.

43—*Clethrionomys gapperi nivarius* (Bailey) Olympic red-back mouse. Abundant in all wooded alpine areas. The relationship to *C. g. occidentalis* needs further clarification. However, there is no reason not to believe that a continuous population of *Clethrionomys* exists from sea level to alpine habitat.

44—*Microtus townsendi townsendi* (Bachman) Townsend meadow mouse. Abundant in lowland meadows. There are colonies found in alpine meadows in Deer Park and Hurricane Ridge that are being studied at present. Large individuals equal in size *Microtus richardsoni arvicoloides* of the Cascade Range and must be trapped with large rat traps.

45—*Microtus longicaudus macrurus* (Merriam) Olympic long-tailed meadow mouse. Uncommon and generally distributed along cold streams at higher elevations, down to sea level. May be common in alpine terrain under favorable circumstances. They are large, strong and fast-moving and are capable of springing a good proportion of museum special traps.

46—*Microtus oregoni oregoni* (Bachman) Oregon meadow mouse. Common over the entire Olympic Peninsula from sea level to alpine meadows; abundant in places, particularly on alpine grassy ridges. This species needs critical study to check variations of its entire range.

47—*Ondatra zibethica osoyoosensis* (Lord) Muskrat. Probably abundant at low elevations in suitable localities. Undoubtedly it is the muskrat that is the "burrowing animal" that does considerable damage to the irrigation ditches in the Sequim area.

48—*Zapus princeps trinotatus* (Rhoads) Jumping mouse. Abundant throughout the Peninsula from sea level to alpine areas. Typical habitat is grassy semi-open areas, generally near streams or ponds.

49—*Aplodontia rufa rufa* (Rafinesque) Mountain beaver. Abundant throughout the Peninsula. This species occurs up to alpine habitat but is less common at higher elevations.

50—*Erethizon dorsatum epixanthum* (Brandt) Porcupine. Rare. Included only provisionally because of occasional reports of occurrence, mainly along the southern base of the Peninsula. Nowhere has this species become well known or common as it is throughout the Cascade Mountains, despite records dating back many years. There are no records for the National Park area.

51—*Lepus americanus washingtoni* (Baird) Brush rabbit. Common throughout the Olympic Peninsula. Abundant in at least one alpine area—Deer Park. Critical study of the alpine population is under way.

52—*Cervus canadensis roosevelti* (Merriam) Roosevelt elk. Abundant on the Peninsula, ranging from sea level to alpine meadows, according to the season.

53—*Odocoileus hemionus columbianus* (Richardson) Black-tailed deer. Abundant throughout the Peninsula from sea level to alpine terrain.

54—*Oreamnos americanus* (Blainville) Mountain goat. Since introduction of eight goats in 1924 at Lake Crescent, this species has increased slowly and spread rather widely. Reliable reports place mountain goats along the high divide (Bogachiel-Sol Duc), Appleton Peak, Hurricane Ridge, and Mount Constance. They can regularly be seen on the rocky hillsides west of the Elwha River bottom.

Introduced animals include the house mouse and rats. No extensive infestation or feral colonies exist thus far on the Peninsula, though conditions for such prevail in the rain-shadow area of Sequim and Port Angeles.

Red fox *(Vulpes fulva* sp.) have apparently secured a firm foothold on the adjoining Kitsap Peninsula during the past fifteen years, and in the farm land south of the Olympic Peninsula. I have no reports of this species extending

onto the Peninsula, however. This is an introduced animal, not the native red fox which is purely an alpine animal of the backbone of the Cascade Mountains.

Gray squirrels *(Scurius griseus griseus* Ord.*)* have been reported as far north as Elma. This and Tacoma represent the present northward extension. Little suitable habitat exists on the Olympic Peninsula.

One final note on animals frequently asked about in relation to the Olympic Mountians: conies *(Ochotona princeps)*, golden-mantled ground squirrel *(Citellus lateralis)*, lynx *(Lynx canadensis)*, and grizzly bear *(Ursus* sp.). There is no indication, past or present, suggesting that these species ever inhabited this area, though the requirements for their existence would seem to be prevalent here.

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College of Puget Sound, Tacoma 6, Washington

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PREPARATION OF MANUSCRIPTS FOR *THE MURRELET*

All articles or notes should be typewritten, double-spaced, and on one side only of standard size typewriter paper. Authors are urged to submit all copy in as good form as possible so that the time of the editors is not used to correct errors or to retype articles before they are sent to the printer.

Observe the style used in The Murrelet. Be sure to check all scientific names, their authority and all spelling; avoid footnotes. If drawings are submitted with an article use india ink for lettering and allow for reduction in size.

Literature citations may be included in the body of the text but if four or more are cited, they should be placed at the end of the paper. For long papers a short summary may be included at the end of the article.

In general, avoid subspecific names except in taxonomic papers where the race has been established beyond doubt. Usually this means the individual bird or mammel must have been collected. If a sight record is submitted in a general note, the term "sight record" normally should appear in the title of the article. The address line should have the author's complete name, address, and date of paper.

The Editors of The Murrelet

SPRING INCIDENCE OF DAMAGE TO FOREST TREES BY CERTAIN MAMMALS

THEO. H. SCHEFFER

In more recent study and appraisal of our forest resources, certain conservation measures, including tree farming, have come into the picture. This particular practice has found expression now a-days in local, or more widely heralded program aid to the smaller farmer in turning his woodlot into present profit and future economic use—tours, lectures, demonstrations. Not only that, but some of the larger timber companies, which for a generation have been harvesting the natural forest stands in the Pacific Northwest, have now set aside large tracts of their cutover lands for tree farming.

In administering, planting and developing these tree farms certain more or less serious difficulties were encountered, which had not formerly concerned forest pioneers who had "trees to burn." Some of these problems have enlisted the mammalogist, whereas in earlier research the entomologist and the forest pathologist, mainly, had tried to assist nature in timber growth and reproduction.

New types of burgeoning vegetation are claiming the lands vacated by depletion of the forests, and, with this growth, a teeming increase of some of the smaller and occasionally of the larger mammal types follows naturally. These mammals, welcoming the new food supplies in the wild and from the tree nurseries, fall upon the seedlings and later the saplings with a natural gusto. This assault, in turn, calls for research and control studies by biologists of the timber companies, the state game departments, and the U. S. Fish and Wildlife Service.

To proceed on familiar ground, we will confine this discussion principally to the Puget Sound country, including the Olympic peninsula. Further, in our present resume of mammal depredations on forest trees we are leaving out the smaller rodent ilk that eats tree seeds and cuts off seedlings. And we will exclude the porcupine, which is of very scant occurrence west of the Cascades; likewise the beaver, which pays its own way many times over in the conservation of timber resources. Such exclusion by arbitrary selection leaves us for this study: the Bear, the so-called Mountain Beaver, and the Gray Squirrel.

The first offender to be noted here, and in a manner the least "offensive," is the Western Gray Squirrel *(Sciurus griseus)*, which has the regretable habit of priming up for spring activities by girdling young fir and pine in scattered stands of the Olympic prairies and in established parks to which it may have access. This habitat of the squirrel is at the northern limit of the oaks *(Quercus garryana)* as one approaches that part of the Puget Sound country overburdened by glacial outwash. As an alibi or whatever for the squirrel, the acorn crop here is always very light, if there is yield at all; so storage for winter use by rodents may often be negligible. Anyhow it is evidently the cambium layer of the growing wood that is sought for food by the Gray Squirrel.

Attack by these squirrels on fir *(Pseudotsuga)* and pine *(P. ponderosa)* occurs in late winter or very early spring, when the sap is rising and the bark makes looser contact with the bole of the tree. Chips of the bark, the width of one's finger and perhaps as long, litter the ground beneath the squirrel's high lunch counter—at safety dfstance above the base of the tree. The girdling deadens the tree tops, which appear first reddish then stark and lifeless on

Left: Litter of bark chips, cut by Western Gray squirrel in feeding on cambium layer of young Douglas fir: Olympia prairie groves, April 20. *Right*: Bark stripping by bear, on fir. Fresh damage, right, season of '51: left, previous season. Photo by Weyerhaeuser Timber Co., 1951, on South Olympic Tree Farm.

Left: Freshly girdled pine (left), and dead tops of young Douglas fir attacked in previous seasons by the Western Gray squirrel: Olympia prairie groves, February 28. *Right*: *Pinus ponderosa* barked by Western Gray squirrels, to get at the cambium layer for food, in early Spring. Olympia prairie groves, March 28.

the skyline. I have counted as many as twenty-five such dead fir tops from one view point—in a park. Later these tops come down, to constitute a fire hazard. But, regretably or not, numbers of this interesting and beautiful squirrel have now been greatly reduced in this region by live trapping in the parks and by limited hunting pressure in the wild.

The Mountain Beaver *(Aplodontia rufa)* claims our attention next. This primitive type of animal is quite abundant in the Puget Sound country, and less so along the Pacific coast down into northern California. Its standards of living are promoted by forest depletion and homestead clearings, which introduce new food supplies or permit abundant growth of suppressed native vegetation. The animal will trim or cut off almost any green thing that grows in its habitat and drag the fresh trimmings to its burrow for immediate consumption or temporary storage. On the tree farms it will prune seedlings, and sometimes slender saplings, to a height occasionally of ten feet or more.

In these higher foraging operations the mountain beaver will always leave stubs of the severed branches as rounds of a ladder for ascent and descent. Shrubbery in mountain beaver range on cutover lands is often kept scrubby and unsightly by repeated pruning of the new growth. Our research into this animal's food habits indicates that it is only under snow burden, at moderate or higher altitudes, that the mountain beaver gnaws the tender bark of saplings or larger tree bases and roots. So the incidence of such damage occurs usually in late winter or early spring, when food stores may have become depleted. The mountain beaver forages the year around, whenever weather conditions will permit; there is no period of hibernation.

The nature explorer in the field in February and March, when snows are melting on the slopes and disappearing, will find trails of the mountain beaver's shuffling progress through the duff of the forest floor as he searches for food supplies. Encountering light saplings weighted to earth by wet snow, the animal will completely bark them, fir or whatsoever. But so far I have not been able to definitely fix on mountain beavers the girdling of conifers at the lower bole or the exposed roots. Identifying tooth marks on the cambium layer of the wood are always prima facie evidence.

We introduce now the Black Bear of the Olympics *(Ursus americanus)* as the major depredator on second growth fir and hemlock, particularly, and on the younger maturing seed trees of these types on the tree farms. This spring-time depredation is a pyramiding development of quite recent years, as critically observed and noted in timber cruises; so much so that the State Game Commission of Washington removed, in 1951, all protection from bears in five counties of the Olympic peninsula—no closed season, no bag limits. And what is more, the management of tree farms has hired hunters and trappers to reduce the bear's numbers in areas of greatest depredation.

Damage by bears to firs and hemlocks, five inches to perhaps a foot in diameter, consists in ripping or stripping the bark from boles of the trees to get at the cambium layer, which is greedily ingested for hunger needs and spring tonic, soon after the animals come out of hibernation. As desert they favor also at this time the roots of skunk cabbage *(Lysichiton)*, of cow parsnip *(Heracleum)* and other types of swamp or lowland plants with succulent root structures. Their hunger in this period may be more or less acute, depending upon sufficiency of the food supply in the preceding late summer and autumn. The abundance of the huckleberry crop in particular is an important consideration.

The bark stripping on conifers is more often to bear reach from the base of the trees, but sometimes, the younger animals perhaps, will climb

the tree to heights of twenty, thirty feet or more, to rip off the more tender bark of the upper bole. From scar evidence on trunks of the young trees, both the claws and the teeth of the bear are employed in tearing off the large flakes or slabs of bark. In case of the fir these slabs are inclined to a point, upward, while in the hemlock the slabs may break off more abruptly above. Apparently these slabs are discarded as of no use for food of the bear. But when the inner layer of fresh slabs is peeled off and eaten it seems quite palatable to human taste and should be nutritious.

Bear hunters and forest rangers who have surprised the animal in the act of ingesting the cambium substance at the denuded tree bole, report that the food is partly licked up, partly scooped in by an upward sweep of the lower jaw. This rather sloppy mode of feeding may account for the incidental ingestion of leaves and fir needles licked up from the duff at the foot of the tree. At any rate such stuff is sometimes found mixed with the soft cambium "mush" in research examination of the bear's stomach content. This could apply also to other food search by the bear on the forest floor—incidental ingestion, rather than selective feeding.

Observations from an elevated viewpoint on tree farms or other cutover lands indicate that the bears follow somewhat regular trails or travel lanes in their peregrinations. Such lanes commonly pass along the ridges and include low or swampy feeding grounds in their course. Too often this course may me marked by dead trees, girdled one year or another by the bears. In an extensive cruise by experienced foresters on one of the large tree farms of the Olympic peninsula, something over five fir trees per acre were found to be dead or damaged by bark stripping. This was close to twenty-five percent of the total fir stand. Many of the damaged trees show both fresh bark stripping of the season, and older denuded patches on the tree boles commonly streaked with pitch exudation.

A curious and rathetr puzzling circumstance of this tree girdling by bears is that in certain areas it seems to be pyramiding. In other words, by tabulation of data in this cruise, thirty percent of the damaged fir trees were found to have been attacked by the bears in the then current season—1951. Not any of the damage seemed to date back more than just a few years. In my own observations extending back over a period of more than thirty years, I have only occasionally noted this type of bark stripping: in the foothills west of Port Angeles, Washington and on a Forest Service planting area east of Tillamook, Oregon.

In a recent critical examination of a considerable number of photographs taken in my mountain beaver research at the Port Angeles site, extending back to 1915, bark stripping of fir by bears can readily be distinguished from girdling, under snow, by mountain beavers. The latter, in their stressed search for food, usually attack maples, wild cherry, and other deciduous trees and shrubs.

In a conference recently with members of the Park Service, at Longmire, first-hand observations were reported by rangers and naturalists from four National parks: Rainier, Yellowstone, Olympic, Glacier. In all these parks bark stripping by bears was noted and recorded—involving Douglas fir, hemlock, Engelman spruce, Lodgepole pine, Alpine fir, Western Red cedar. The incidence of damage was always in the early spring, when sap flow and growth start in the cambium layer of the younger tree trunks. The damage, as of all reports, was considered negligible—rather as indicating an interesting food habit of bears, perculiar in its nature and consistent in its seasonal incidence.

Collaborator: *U. S. Biological Survey*

GENERAL NOTES

New Birds from Whitman County, Washington

On the basis of a mimeographed list of birds of southeastern Washington prepared by Hudson and Yokom of Washington State College (1949) the following would appear to be new records.

Semipalmated Sandpiper *(Erolia pusillus)*. A male was collected by the writer from a block of about ten Western Sandpipers August 28, 1949, at Texas Flat, four miles southwest of Ewan.

Common Tern *(Sterna hirundo)*. On August 19, 1949, Earl J. Larrison and the writer collected a single male at the same locality as the sandpiper.

From field observations made in northern Idaho it would appear that both species are regular migrants in small numbers. The common tern appears to move through this area rapidly while the semipalmated sandpiper is ordinarily missed at it is mixed with western and least sandpipers.—MALCOM JOLLIE, *University of Idaho, Moscow, Idaho; November 13, 1952.*

New Winter Records of Bats in British Columbia

The winter occurrence of the big brown bat *(Eptesicus fuscus)* in British Columbia was first recorded on the basis of a specimen collected by me in 1943 (Cowan, *Murrelet* 25:1944:45).

Since that time additional information on the status of this species has accumulated that makes it certain that hibernating at these latitudes is not a chance occurrence. These bats hibernate in an inhabitated building and it is interesting to note that they occupy the building throughout the year. Specimens have been taken in July, August, December and February at various times from 1943 to 1950.

A new and apparently the most northerly wintering record in Canada is provided by capture of a specimen at Prince George, British Columbia, latitude 54° N. This, an adult male, was taken in the basement of a building on October 28, 1951.

The Western big-eared bat *(Corynorhinus rafinesquei townsendi* Cooper) has also been found hibernating in several abandoned mine shafts near Williams Lake. Both sexes have been taken at these sites. One female was collected on January 17, 1946 in an abandoned shaft about 250 feet under ground. Several of them, together with a single *Myotis lucifugus alascensis* Miller were hibernating in another shaft near Williams Lake on November 17, 1948. The same tunnels are occupied by the bats during the summer months.—LEO JOBIN, *Williams Lake, B. C.*

Notes and Records of Peales Falcon and the Duck Hawk in the Cariboo, British Columbia, Canada

During my summer holidays between 1946 to 1951 I collected birds and mammals in the White Water Lake district in the mountains south of Chilco Lake and in the Chilcotin River valley from Redstone east down stream to the Fraser River. Among my specimens was one immature female Peale Falcon *(Falco peregrinus pealei)* taken west of Alkali Lake, August 9, 1948. This seems to constitute a record for this part of British Columbia.

While traveling within the area described above I noticed several eyries occupied by the Duck Hawk *(Falco peregrinus anatum)*. Each eyrie was on a high ledge near a river or lake. Under each nesting place were the remains of many species of birds and some small mammals. It was noticeable that near these peregrine eyries only on few occasions were small birds molested. Robins, for instance, were nesting and singing in the vicinity of the falcons without

showing any signs of alarm. One pair of *anatum* was raising young near Hanceville, Chilcotin, British Columbia and while camping there I had a good opportunity to study them. One bird would fly for several miles over a flat area covered with small lakes and return in some instances in approximately one or two hours with a young water fowl in its talons. A few minutes after reaching the eyrie, the other falcon would leave the vicinity for the flat country to hunt. Each time that I approached one of these birds' nesting site I was greeted with a very noisy reception. With the increase of hunters into this country and the tendency of the average man to kill hawks on sight, I am afraid that in a not-too-far future, hawks will disappear entirely from the few nesting areas they occupy at present.

Falcons return to their nesting ground in this region late in March or early April, and begin to clean the old nesting place which would appear to be occupied year after year.

In one of these bird eyries I collected the male, in another one I collected the female. The following spring each eyrie was occupied by one adult bird only, and in both instances the birds were on the nest, but at my approach would fly away without noise. The third year, both nests were occupied again, but this time by adults; in each instance three young were raised. I have no way of telling if these birds found a mate or if the occupants were two different pairs.

I have never noticed duck hawks in this part of the province during the winter months.—LEO JOBIN, *Williams Lake, British Columbia.*

Records of the Burrowing Owl and Long-Eared Owl in the Cariboo, British Columbia, Canada

On September 11th, 1948 in the Beaver Valley situated about 30 miles east of Williams Lake, B. C., I was able to collect a specimen of the Burrowing Owl *(Speotyto cunicularia hypugaea)*. On examination the bird proved to be a mature male. It totaled 220 mm. and had its stomach and crop full of grasshoppers. The second specimen—a female—was found at Alkali Lake November 20, 1949. It also totaled 220 mm. and had its stomach empty.

During the winter 1948-49 several Long-Eared Owls *(Asio otus wilsonianus)* were noticed in this area. I collected three specimens in good condition, and one juvenile badly damaged. The specimens are as follows, all from Alkali Lake: female, January 18, 1949; male, February 2, 1949; female, March 16, 1949.

According to J. A. Munro and I. McT. Cowan (Bird Fauna of British Columbia, December, 1947) these birds have not been collected previously in this part of British Columbia.—LEO JOBIN, *Williams Lake, British Columbia.*

Notes and New Records of Falco Rusticolis Obsoletus *for the Cariboo District of British Columbia, Canada*

Some gyrfalcons were heretofore apparently found on Vancouver Island (Munro and Cowan, "Review of the Bird Fauna of British Columbia," 1947). Recent records of this bird in the Cariboo seem to be noteworthy. On April 1, 1944 I was able to photograph a gyrfalcon in the act of devouring a prairie chicken one mile south of the village of Williams Lake, British Columbia. On January 18, 1952 near Alkali Lake I was able to collect a large female. This bird totaled 580 mm. in length and weighed four pounds. The stomach contained one *Microtus*.

The district where gyrfalcons are to be found is open range country east of the Fraser River and about 25 miles southwest of the village of Williams Lake. The lake itself is surrounded by small patches of willow and swamp

grass which form an ideal cover for the many game birds that inhabit the area. During the last few years I have observed several gyrfalcons in close range with powerful field glasses, and it would appear that all the birds noticed in this part of British Columbia were juvenile, a fact that might indicate the inability of young birds to survive the severe winter of the far north. Also it might be mentioned that the presence of falcons in this area seems to coincide with the low point of the lemming or ptarmigan population of the arctic. During the winter gyrfalcons are victims of steel traps set by trappers. Many more are destroyed from poisoned bait used by fox or wolf hunters in the north. This might be the main cause of the scarcity of these birds even in their natural habitat here.—LEO JOBIN, *Williams Lake, British Columbia.*

Northern Waterthrush (Seiurus noveboracensis) *in Grant County, Washington*

On August 20, 1952 I saw one of these birds at close range in the George Grant orchard about one and one-half miles north of Ephrata. It was observed about 6:30 in the morning in deep shade near small furrows of irrigation water. At the time I was making a census cruise and did not have a gun. Later in the morning I made an intensive search of the orchard without success. Although the general environment of sage brush semi-desert is entirely unsuitable for these birds, the conditions in the apple orchard appeared quite favorable.—GEORGE E. HUDSON, *Dept. of Zoology, Washington State College.*

Antelope Ground Squirrel (Citellus leucurus) *in Twin Falls County, Idaho*

On July 1, 1952 one family of these squirrels was located in the sand dunes about six miles south of Hagerman and one mile south of the Snake River. Two juveniles collected are numbers 52-172 in the Conner Museum collection. No others were observed. According to Davis this extends the known range in Idaho about 25 miles to the southeast from Glenns Ferry. (The Recent Mammals of Idaho, 1939).—GEORGE E. HUDSON, *Dept. of Zoology, Washington State College.*

Black-billed Cuckoo (Coccyzus erythropthalmus) *at Gray's Lake, Bonneville County, Idaho*

On June 20, 1952 I collected an adult female in breeding condition about one mile north of Gray on a brushy hillside covered with service-berry, aspen, etc. This specimen was made into a skin and is now number 52-137 in the collection of the Conner Museum. Another individual was heard calling on the day and on the succeeding day, but I was unable to find it. The first specimen taken in Idaho was reported by Arvey in the *Condor* (43:291, 1941).—GEORGE E. HUDSON, *Dept. of Zoology, Washington State College.*

The Black-Billed Cuckoo in Eastern Washington

While engaged in field work on July 1, 1952 on the timbered north slope of Kamiak Butte, an isolated hill located nine miles north of Pullman, Whitman County, extreme eastern Washington, I heard a distinctly cuculine call from high in a Western Yellow Pine. I subsequently located the singer, perched about 50 feet up, and shot it. To my considerable surprise it proved to be a Black-billed Cuckoo *(Coccyzus erythropthalmus)* which, upon dissection, I found to be an adult malte, testes 8.5 mm. in length. The skin is now in the collection of the Charles R. Conner Museum at the State College of Washington.

From an examination of the literature, I find that Arvey (*Condor*, 43:291, 1941) collected an ovulating female in Boise County, southwestern

Idaho, on July 10, 1941. This record constituted a westward extension of the then-known casual range of the Black-billed Cuckoo. My specimen provides a still farther westward extension of that range and, to the best of my knowledge, the first report of this species in the State of Washington.—JAMES R. KING, *Dept. of Zoology, State College of Washington, Pullman.*

BOOK REVIEWS

LARRISON, EARL J. 1952. *Field Guide to the Birds of Puget Sound.* Seattle Audubon Society, 112 pages; 12 plates; paper $1.

The author sets forth a popular idea in bird identification. The birds are divided into two sections: water birds and land birds. The land forms are further sub-divided into groups based on size alone (as related to the robin) and all are generally grouped according to "ducks," "grebes", "sparrows", etc. Within each group the species are in alphabetical order.

Each bird has been provided with a brief field description. Descriptions of immatures are omitted. In addition the length (in inches) for each species is given as is a brief summary of its distribution, its nesting habits, its egg size and coloration, clutch size, and its voice, herein called "notes".

Eight pages are devoted to a biotic description of the territory and recommended bird field trips in the Puget Sound area with a few remarks of a general nature, on the identification of birds. Finally, there is a two-page list of trees and shrubs (mostly native) which can be used to attract birds.

The guide is handy pocket size and should prove useful to the amateur ornithologist in the region, but does seem to point up the need for a more exact set of terms to show the distribution of the species. For example, who is to determine the difference between "rare", "very rare", "uncommon", etc. without searching the literature? If a species is of regular occurence how is the amateur to distinguish between "winter visitor" and "winter resident"?

The guide suitably memorializes the late Ellsworth Lumley, teacher and conservationist—*Gordon D. Alcorn, College of Puget Sound, Tacoma, Washington, December 1, 1952.*

PATTERSON, ROBERT L. 1952. *The Sage Grouse in Wyoming.* Sage Books, Inc., Denver, Colorado. 341 xii pages. Illustrated with 169 photos, tables, figures and many attractive thumb-nail sketches by Charles W. Schwartz. $5.00.

The Wyoming Fish and Game Commission is to be commended for its foresight in initiating and supporting over a period of twelve years the sage grouse investigations on which the text is based. The author has spent the last four years in a continual field study of the birds in the Upper Green River Basin as an employee of the Wyoming Commission. "The Sage Grouse in Wyoming" is the first book that has been published on a typical western game bird.

The text is divided into four parts. Part 1 is devoted to the factors affecting the sage grouse abundance, including an account of the restoration of the species in recent years. Part II presents the natural history and general behavior of a grouse population. Part III "Sage Grouse and Man" gives the history of the program, technique of trapping, and handling sage grouse in captivity. Part IV discusses restoration and management applicable to this grouse and forecasts the future of the sage grouse. Pages 313 to 320 are devoted to lists of mammals and birds found within the sage grouse study area. The photos are excellent and show the habitat of this interesting bird at all seasons of the year over a wide area in Wyoming.

On page 18 and elsewhere Malheur (County, Oregon) is mispelled. On page 22 the statement "the first photographs (and motion pictures) ever obtained of strutting sage grouse have been credited to Horsfall (op. cit) and were taken at Klamath Lake, Oregon." This is in error. The first strutting sage cock pictures were actually photographed by William L. Finley at the now-abandoned cattle ranch of Charles Laird on the west side of Lower Klamath Lake, Siskiyou County, California during the month of May, 1917 (see Zoological Society Bulletin. Vol. XXIII, No. I, January, 1920. pp 3-6, New York) by Bruce Horsfall. Game Warden Jack Furber, Mr. Horsfall, and this reviewer were there to assist Mr. Finley on this project.

Having studied the sage grouse as an ornithologist more or less the past 39 years, in seven states, I am delighted to see Mr. Patterson's volume at this time. The author has accomplished a fine job and both he and the Wyoming Commission are to be congratulated. I recommend that a copy of "The Sage Grouse in Wyoming" be on the study shelf of every student of western game birds. —STANLEY G. JEWETT, *Portland, Oregon. October 23, 1952*

DONALD S. FARNER. *Birds of Crater Lake National Park.* University of Kansas Press, September 3, 1952, xi 187 pp., 16 figs., map, paper bound.

Dr. Farner began the study of the birds of this interesting area during the summer of 1939 and has served as a temporary naturalist during several periods up to the time of publication of this report. The first available notes on the birds of this park were made by Major Charles E. Bendire on July 27, 1882. Since that time many ornithologists have visited the area and published a few fragmentary notes. Dr. Farner has brought

all available data together, including his personal investigations and the notes compiled by the ranger-naturalists working within the park. This is an excellent summation of the ornithology as known at present, not only from Crater Lake National Park, but of the southern Cascade Mountains in Oregon. Dr. Farner is to be congratulated for doing a fine piece of work that will be greatly appreciated by all bird students visiting this area.—STANLEY G. JEWETT, *Portland, Oregon. November 29, 1952.*

F. H. MANNING. *Birds of the West James Bay and Southern Hudson Bay Coasts.* National Museum of Canada. Bulletin No. 125 Biological Series, Department of Resources and Development. Ottawa, Canada. 1952. 114 pp., 13 photos, 1 map, paper covers.

The collecting and study of birds in the Hudson Bay region dates back to the early days of the Hudson's Bay Company. James Isham of England first went to York Factory in 1732 and to Churchill in 1741, returning to England in 1745, taking with him at least part of his collection. From that early date the birds of Hudson Bay received much attention and many specimens were preserved and sent to England by the employees of the Hudson Bay Company. Not until the publication of E. A. Preble's "A Biological Investigation of the Hudson Bay Region" (North American Fauna No. 22, U. S. Biological Survey, Washington, D.C.) in 1902 were the accumulated data brought together in one volume. Since Prebles' time many scientific expeditions and independent collectors have worked in the region, and probably no like area in the north has been so thoroughly studied. Mr. Manning, with several assistants, has collected a large number of specimens for the National Museum of Canada since the summer of 1947. The present report gives the result of his own work and a summation of all the ornithological work in the region since the time of James Isham in 1732. There is an interesting chapter on "Previous Work in the Region." Also "Description of the Region," a systematic list of the birds with notes on distribution and relative abundance and an extensive bibliography. Manning's report is a valuable contribution to the ornithology of that part of central Canada and will long serve as a guide to future workers in that region.—STANLEY G. JEWETT, *Portland, Oregon, November 29, 1952.*

The Society regrets to announce the death of member Harry William Schnell at Seattle on July 31, 1952. Mr. Schnell is survivied by his wife.

Mr. Schnell was born in Glasgow, Missouri on August 28, 1887, and emigated west to Spokane in 1904 when but 17 years of age. At age 21 he moved to Kalispell, Montana, which remained his home till 1923 when he moved to Seattle. It was in Kalispell, Montana where he met Ena Jones and they were married there in June 1911.

For a long period of years Mr. Schnell was established in abstract and title insurance work in Kalispell and later in Seattle he became secretary and vice-president of the Northwestern Fire Insurance Company until he retired. Mr. Schnell had many and varied additional interests in life and not the least of them was his interest in all the birds that frequented the area about his home on Hanford Street in Seattle.

The Society will miss Mr. Schnell and his jovial personality at its meetings in Seattle. Our sympathy is extended to Mrs. Schnell in her great loss.

WEBSTER H. RANSOM, *Bellevue, Washington, Sept. 30, 1952.*

SOCIETY MEETINGS

APRIL, 1952—The annual meeting of the society was held in the Walker Ames room, Parrington Hall, University of Washington, at 2 p. m., Saturday, April 19, 1952. Vice-president Burton T. Ostensen, presided in the absence of Webster H. Ranson who was ill.

The minutes of the previous meeting were read and approved. The annual reports of the secretary, treasurer, and auditor were read and accepted. The editor reported that the society now has fifty library and institutional memberships and eleven exchanges. She also reported on the difficulties encountered in publishing Stanley Jewett's "Birds of Washington," giving the reasons why the University of Washington Printing Department has suspended publication.

Mrs. Flahaut suggested that the society publicly thank the many contributing members who have helped ease the financial condition of the society.

Two new members were elected; they are: J. Halor Titcomb, Tacoma, Washington and Charles S. Berrimen, Indianapolis, Indiana. Two honorary life members were elected; they are: Olaus J. Murie, Wyoming; Kenneth Racey, Vancouver, British Columbia.

Tellers were appointed to count the ballots.

The program consisted of the following papers: Zella McM. Schultz: "Molts and Plumages of the Adult Glaucous-winged Gull"; Dr. Murray L. Johnson and Dr. Wesley Clanton: "The Merriam Shrew"; Dr. G. Clifford Carl: "Field Notes and Observation from British Columbia"; Garrett Eddy: "Bear Damage to Young Douglas Fir Forest"; Gardiner T. Jones: "Report of the Game Department's Investigation of Bear Damage in the Forests."

The afternoon meeting was closed to reconvene at dinner which was held in the Student Union Building with thirty-six members and guests present. Dr. Ostensen welcomed the group. Those present introduced themselves, each telling briefly of their work, observations, and interest in the society.

The evening program was a series of colored films taken by Dr. Congdon at Churchill, Manatoba showing the rare Hudsonian Godwit. Mr. Walter Eyerdam spoke about the *Achatina* snail which has become a devastating pest in many of the Pacific islands.

The tellers announced the election returns and the following officers were elected for 1952-53: President, Garrett Eddy; First Vice-president, Gardiner T. Jones; Secretary, Burton T. Ostensen; Treasurer, Charles F. Yocum; Trustee 1955, Ian McT. Cowan; Vice-president for British Columbia, James Hatter; Vice-president for Inland Region, Thomas Burleigh; Vice-president for Oregon, Robert M. Storm. The secretary was instructed to write into the minutes the deep regret felt by the members of the society over the deaths of two members: Dr. J. D. Terry, Seattle, Washington, and Mrs. Herbert Stanton Griggs, Tacoma, Washington. The retiring editor of The Murrelet was given a rising vote of thanks for the many years of service she gave the society, also the secretary was thanked by the society for her efforts.

The May meeting in Moscow was announced and a last call made for papers to be presented at the June meeting of the Pacific Division of the A.A.A.S. in Corvallis.—MARGARET A. IVEY, *Secretary*

MAY, 1952—A regular meeting of the Pacific Northwest Bird and Mammal Society was held at the University of Idaho, Moscow, Idaho, on May 17, 1952.

Earl Larrison presided in the absence of President Garrett Eddy.

Minutes of the annual meeting were read and accepted. Donald B. Reid of Winnipeg, Manitoba was accepted for membership.

Means of increasing membership by a more formal approach to prospective members were discussed.

The following papers were presented: Malcolm Jollie, "History of the University of Idaho Bird Collection." The collection now includes 2100 specimens representing 250 species. Methods of preventing insect damage to bird and mammal specimens were discussed.

D. S. Farner and H. K. Buechner: "Some Recent Concepts of Avian Population Dynamics." After a period of juvenile mortality, the probability of death is independent of age. Experience seems to be no factor in survival; mortality factors operate in a random fashion.

James Burns: "Effects of Preservatives on the Full Color of Mammal Specimens." Various preservative chemicals commonly used on mammal skins showed measurable modification of color, chiefly lightening of tones.

L. R. Mewalt: "The Post-Nuptial Molt in Clark's Nutcracker." Molt takes most of the year for entire population commencing in March and continuing through January.

D. S. Farner and L. R. Mewalt: "Sex Ratios in Migrating and Wintering White-crowned Sparrows in the Palouse Country." Winter population in Snake River is dominately male.

Kenneth Hungerford: "Some Observations on the Life History of the Idaho Ruffed Grouse." Seasonal movements of ruffed grouse up and down the ridges are a marked pattern. Details of seasonal use by grouse of various habitats were noted.

Bill F. Musgrove: "Traps and the History of Traps with Special Reference to the Trapping of Fur-bearers." The first steel traps were man-traps to catch poachers. Various sizes and types of traps were demonstrated and their use discussed.—BURTON T. OSTENSON, *Secretary*.

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